Taylor & Francis
Taylor & Francis Group

INTERNATIONAL JOURNAL OF SYSTEMS SCIENCE

VOLUME 34

January 2003 to December 2003

Editor

P. J. Fleming, Department of Automatic Control and Systems Engineering, University of Sheffield, Mappin Street, Sheffield S1 3JD, UK, email: ijss@sheffield.ac.uk

Co-Editor

Visakan Kadirkamanathan, Department of Automatic Control and Systems Engineering, University of Sheffield, Mappin Street, Sheffield S1 3JD, UK, email: visakan@sheffield.ac.uk

Regional Editor (Asia–Pacific)

C. W. Chan, Department of Mechanical Engineering, The University of Hong Kong, Pokfulam Road, Hong Kong, PR China, email: mechan@hkucc.hku.hk

Editorial Board

D. Caldwell, Department of Electrical Engineering, University of Salford, UK.
D. W. Corne, Department of Computer Science, Cybernetics & Electronic Engineering, The University of Reading, UK.
A. Gunasekaran, Department of Management, University of Massachusetts, USA.
R. F. Harrison, Automatic Control & Systems Engineering, The University of Sheffield, UK.
G. J. Klir, Department of Systems Science, Thomas J. Watson School of Engineering, Applied Science and Technology, State University of New York at Binghamton, USA.
D. M. Lane, Department of Computing & Electrical Engineering, Herriot-Watt University, UK
T. H. Lee, Centre for Intelligent Control, Department of Electrical Engineering, National University of Singapore, Singapore.
D. T. Pham, Cardiff School of Engineering, University of Wales, UK.
Hoang Pham, Department of Industrial Engineering, State University of New Jersey, USA.
J.-P. Richard, Ecole Centrale de Lille, France.
A. Ruano, ADEEC, Faculty of Science & Technology, Universidad do Algarve, Portugal.
J. K. Sengupta, Department of Economics, University of California, Santa Barbara, USA.
S. K. Spurgeon, Department of Engineering, University of Leicester, UK.
Ah Chung Tsoi, Faculty of Informatics, University of Wollongong, Australia.
H. Wang, Bell Laboratories, New Jersey, USA.
J. Whidborne, Department of Mechanical Engineering, King's College, London, UK.
B. A. White, Aerospace & Guidance Systems Department, Royal Military College of Science, Cranfield University, UK.
R. K. Yedavalli, Department of Aeronautical and Astronautical Engineering, Ohio State University, USA.

Consulting Editor

C. J. Harris, Department of Electronics and Computer Science, University of Southampton, Highfield, Southampton, SO17 1BJ, email: cjh@ecs.soton.ac.uk

Subscription Information

International Journal of Systems Science is published monthly with extra issues in February, June and October by Taylor & Francis Ltd, 4 Park Square, Milton Park, Abingdon OX14 4RN, UK. This journal is subject to a peer-review process.

Annual Institutional Subscription 2003

ISSN 0020 7721 $3327 £2017

A subscription to the print edition includes free access for any number of concurrent users across a local area network to the online edition, ISSN 1464–5319.

USPS permit number 980 560. Periodical postage paid at Champlain, NY, by US Mail Agent IMS of New York, 100 Walnut Street, Champlain, NY, New York. **US Postmaster**: send address changes to tSYS, PO Box 1518, Champlain, NY 12919, USA.

Dollar rates apply to subscribers in all countries except the UK and the Republic of Ireland, where the pound sterling price applies. All subscriptions are payable in advance and all rates include postage. Journals are sent by air to the USA, Canada, Mexico, India, Japan and Australasia. Subscriptions are entered on an annual basis, i.e. January to December. Payment may be made by sterling cheque, dollar cheque, international money order, National Giro, or credit card (Amex, Visa, Mastercard). Orders originating in the following territories should be sent direct to the local distributor. **India**: Universal Subscription Agency Pvt. Ltd, 877 Phase V, Udyog Vihar, Gurgaon, 122001, India. **Japan**: Kinokuniya Company Ltd, Journal Department, PO Box 55, Chitose, Tokyo 156. **USA, Canada and Mexico**: Taylor & Francis, Inc., Journals Department, 325 Chestnut Street, 8th Floor, Philadelphia, PA 19106, USA. **UK and all other territories**: Taylor & Francis Ltd, Rankine Road, Basingstoke, Hampshire RG2 8PR.

For a complete and up-to-date guide to Taylor & Francis Group's journals and books publishing programmes, and details on advertising in our journals, visit our web site:

http://www.tandf.co.uk/journals

The print edition of this journal is typeset by Keyword Publishing Services, and printed on ANSI conforming acid free paper by Henry Ling Ltd. The on-line edition of this journal is hosted by MetaPress at journalsonline@tandf.co.uk

CONTENTS OF VOLUME 34

NUMBER 1—15 JANUARY 2003

Strict positive realness for linear time-delay systems
G. Lu, D. W. C. Ho and L. F. Yeung ... 1

Dynamic space allocation for temporary storage
K. H. Kim and K. T. Park ... 11

Comparison of four gradient-learning algorithms for neural network Wiener models
A. Janczak ... 21

Improved version of the McMurtry–Fu reinforcement learning scheme
N. Kaddour, P. Del Moral and E. Ikonen ... 37

Unified initial condition response analysis of Lur'e systems and linear time-invariant systems
P. Gurfil and M. Jodorkovsky ... 49

Performance optimization of continuous-time Markov control processes based on performance potentials
T. Hao, X. Hongsheng and Y. Baoqun ... 63

Performance evaluation of channel management on an RNC system in multimedia wireless networks
K.-H. Lee and H. Hwang ... 73

NUMBER 2—10 FEBRUARY 2003

Schur decomposition and model reduction in the design of two-dimensional separable-denominator digital filters
R. W. Aldhaheri ... 83

New approach on the automatic tuning of multivariable PI controllers using relay feedback
S. Menani and H. Koivo ... 93

Neurofuzzy network based self-tuning control with offset eliminating
C. W. Chan, X.-J. Liu and W. K. Yeung ... 111

Adaptive stabilization for stochastic parametric-strict-feedback systems with Wiener noises of unknown covariance
H.-B. Ji, Z.-F. Chen and H.-S. Xi ... 123

On some inventory models involving shortages under an announced price increase
A. K. Ghosh ... 129

Towards true linguistic modelling through optimal numerical solutions
R. J. G. B. Campello and W. C. Amaral ... 139

NUMBER 3—20 FEBRUARY 2003

Estimation of a reduction in CO_2 emissions by shifting commuters' travel mode from the private car to public transport
B. Li and H. Tamura ... 159

Singular perturbation approach to trajectory tracking of flexible robot with joint elasticity
B. Subudhi and A. S. Morris ... 167

Adaptive weighting inverse method for the estimation of input loads
C.-K. Ma, P.-C. Tuan, J.-M. Chang and D.-C. Lin ... 181

Queue length analysis of batch arrival queues under bilevel threshold control with early set-up
H. W. Lee, N. I. Park and J. Jeon ... 195

Residual mode filters and $\mathcal{H}_\infty$ control for a class of infinite-dimensional discrete-time systems
H. Sano ... 205

A novel approach for optimizing the optical performance of the broadband tap coupler
C.-M. Hsu, C.-T. Su and D. Liao ... 215

D-stability problem of discrete singularly perturbed systems
F.-H. Hsiao, J.-D. Hwang and S.-T. Pan ... 227

NUMBER 4—15 MARCH 2003

Economic Order Quantity model with Weibull deterioration distribution, shortage and ramp-type demand
B. C. Giri, A. K. Jalan and K. S. Chaudhuri ... 237

Optimal payment time for retailer's inventory system
H.-C. LIAO and Y.-K. CHEN ... 245
Mean-variance-skewness model for portfolio selection with transaction costs
S. LIU, S. Y. WANG and W. QIU ... 255
Rationalization of singularly perturbed continuous systems with time delays
K.-H. SHIM and M. E. SAWAN ... 263
A grey-based clustering algorithm and its application on fuzzy system design
C.-C. WONG and H.-R. LAI ... 269
Resilient guaranteed cost control for uncertain discrete linear jump systems
X. GUAN, J. WU, C. LONG and P. SHI ... 283
Singular linear-quadratic optimal control problem for a class of discrete singular systems with multiple time-delays
F. JUN'E, C. ZHAOLIN and M. SHUPING ... 293

NUMBER 5—15 APRIL 2003

Optimal maintenance model for a multistate deteriorating system: a geometric process approach
Y. LAM and Y. K. TSE ... 303
New elevator group-control method for up-peak periods
S. HIKITA ... 309
Parallel algorithms for model reduction of discrete-time systems
P. BENNER, E. S. QUINTANA-ORTÍ and G. QUINTANA-ORTÍ ... 319
Identification of nonlinear systems via piecewise general orthogonal polynomials operator
W. BIN, Z. YI-SHENG and T. NAN-LIN ... 335
Quadratic cost output feedback control for bilinear systems
S. SASAKI and K. UCHIDA ... 345
Eigenstructure assignment design for proportional-integral observers: the discrete-time case
G. R. DUAN, G. P. LIU and S. THOMPSON ... 357
H^{∞} fault detection filter design for linear discrete-time systems with multiple time delays
B. JIANG, M. STAROSWIECKI and V. COCQUEMPOT ... 365

NUMBER 6—15 MAY 2003

Stable direct adaptive fuzzy control for a class of MIMO non-linear systems
T.-P. ZHANG ... 375
Robust decentralized stabilization of large-scale systems via eigenstructure assignment
B. LABIBI, B. LOHMANN, A. KHAKI SEDIGH and P. JABEDAR MARALANI ... 389
Fuzzy opportunity cost for EOQ model with quality improvement investment
H.-C. CHANG ... 395
Discrete-time timescale analysis via a new separation ratio and unified approach
H. SINGH, R. H. BROWN and D. SUBBARAM NAIDU ... 403
Quantifying bounded rationality: Managerial behaviour and the Smith predictor
C. E. RIDDALLS and S. BENNETT ... 413
Modelling, control, and stability analysis of non-linear systems using generalized fuzzy neural networks
Y. GAO and M. J. ER ... 427

NUMBER 7—10 JUNE 2003

Fixed-point smoothing with non-independent uncertainty using covariance information
S. NAKAMORI, R. CABALLERO-ÁGUILA, A. HERMOSO-CARAZO and J. LINARES-PÉREZ ... 439
On feedback-controlled synchronization of chaotic systems
X. LIAO and G. CHEN ... 453
Maximum bounds for robust stability of linear uncertain descriptor systems with structured perturbations
C. LIN, J. WANG and C. B. SOH ... 463
Multidimensional mutations in evolutionary algorithms based on real-valued representation
A. OBUCHOWICZ ... 469

Robust $\mathcal{H}_\infty$ and guaranteed-cost filter designs of uncertain time-varying delay systems
J. H. KIM ... 485

NUMBERS 8–9—4 JULY 2003

SPECIAL ISSUE

Time Delay Systems: Theory and Control
Guest Editors: Michel Dambrine and Jean-Pierre Richard

Editorial to the IJSS Special Issue on Time Delay Systems: Theory and Control
MICHEL DAMBRINE and JEAN PIERRE RICHARD ... 495
Stability and control of feedback systems with time delays
J. K. HALE and S. M. VERDUYN LUNEL ... 497
Asymptotic properties of the solutions for discrete Volterra equations
V. B. KOLMANOVSKII ... 505
Generic decoupling problems for structured time-delay systems
O. SENAME ... 513
Feedback realization of non-singular precompensators for linear systems over a polynomial ring
V. VAN ASSCHE, J.-F. LAFAY and J. J. LOISEAU ... 523
A Generalized flatness concept for nonlinear delay systems: motivation by chemical reactor models with constant or input dependent delays
J. RUDOLPH and J. WINKLER ... 529
On the delay sensitivity of Smith Predictors
W. MICHIELS and S.-I. NICULESCU ... 543
Sliding mode control of systems with time-varying delays via descriptor approach
E. FRIDMAN, F. GOUAISBAUT, M. DAMBRINE and J.-P. RICHARD ... 553

NUMBERS 10–11—15 AUGUST–15 SEPTEMBER 2003

SPECIAL ISSUE

Time Delay Systems for Communication Networks
Guest Editors: Hughes Mounier and Jean-Pierre Richard

IJSS Special Issue on Telecommunications
H. MOUNIER and J.-P. RICHARD ... 561
Linear time delay model for studying load balancing instabilities in parallel computations
C. T. ABDALLAH, N. ALLURI, J. D. BIRDWELL, J. CHIASSON, V. CHUPRYNA, Z. TANG and T. WANG ... 563
Stability of ABR congestion control using the theory of delayed differential equations
O. AIT-HELLAL and E. ALTMAN ... 575
Fluid modelling of packet switching networks: perspectives for congestion control
F. CHATTÉ, B. DUCOURTHIAL, D. NACE and S.-I. NICULESCU ... 585
Total delay compensation in LAN control systems and implications for scheduling
P. H. BAUER, C. LORAND, M. SICHITIU and K. PREMARATNE ... 599
Round trip time TCP tracking: a first step towards QoS pricing
H. MOUNIER, G. BASTIN, V. VÈQUE and L. ZITOUNE ... 607
Admission and routing control with partial information and limited buffers
E. ALTMAN, R. MARQUEZ and U. YECHIALI ... 615
Dead-time and feed-forward disturbance compensation for congestion control in data networks
S. MASCOLO ... 627

NUMBERS 12–13—10–20 OCTOBER 2003

Regional flux reconstruction for parabolic systems
E. ZERRIK, H. BOURRAY and A. EL JAI ... 641

The performance of discrete linear time-varying control for l_2 disturbance rejection
J. ZHANG and C. ZHANG ... 651
Fuzzy modelling and simulation for aggregate production planning
J. TANG, R. Y. K. FUNG and K.-L. YUNG ... 661
Robust exponential stabilization for uncertain systems with state and control delay
P.-L. LIU 675
A statistical approach to multiple-attribute decision-making with interval numbers
Q. ZHANG, J. MA, Z.-P. FAN and W.-C. CHIANG ... 683
Adaptive Kernel-based equalization for non-stationary digital communications channels
B. MITCHINSON and R. F. HARRISON ... 693
Robust decentralized control of large-scale systems via H_∞ theory and using descriptor system representation
B. LABIBI, B. LOHMANN, A. K. SEDIGH and P. J. MARALANI ... 705
A simulation-based approach to study stochastic inventory-planning games
J. J. RAO, K. K. RAVULAPATI and T. K. DAS ... 717

NUMBERS 14–15—15 NOVEMBER–15 DECEMBER 2003

SPECIAL ISSUE

Data-driven Modelling Methods and their Applications
Guest Editor: C. W. Chan

Editorial: special issue on data-driven modelling methods and their applications
C. W. CHAN ... 731
Experimental design and model construction algorithms for radial basis function networks
X. HONG and C. J. HARRIS ... 733
A linear parameter-varying radial basis function model and predictive control of a chemical reactor
D. L. YU and D.-W. YU ... 747
Modelling of river discharges and rainfall using radial basis function networks based on support vector regression
K. Y. CHOY and C. W. CHAN ... 763
Fuzzy prediction model for water demand prediction using an interpolative fuzzy reasoning method
M. SHIMAKAWA and S. MURAKAMI ... 775
Robust fuzzy Gustafson–Kessel clustering for nonlinear system identification
L. REN and G. W. IRWIN ... 787
Takagi–Sugeno model synthesis of a quasi-linear multiwheeled mobile robot
J. T. ECONOMOU, A. TSOURDOS, B. A. WHITE and P. C. K. LUK ... 805
Data-driven fuzzy modelling of a rotary dryer
L. YLINIEMI, J. KOSKINEN and K. LEIVISKÄ ... 819
Real-time simulation and control systems design by the Response Surface Methodology and designed experiments
P. STEWART, P. J. FLEMING and S. A. MACKENZIE ... 837
Application of stochastic approximation techniques in neural modelling and control
A. VANDE WOUWER, C. RENOTTE and M. REMY ... 851